Granite State Clean Cities

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Propane Mower Incentive Program

U.S.Dept. of Energy Funding Opportunities

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Green Your Fleet! Workshop is filling up!

Last chance to register!
(You must preregister to attend)

Green Your Fleet!

Friday June 6th 9:00 a.m.-3:40 p.m.

Lakes Region Community College
379 Belmont Road, Laconia, NH

Join us this Friday in New Hampshire's beautiful lakes region to attend the state's largest alternative fuel

vehicle workshop and exhibit. Get your fleet "greener" with tips on the latest in fuels and vehicle technology!

Dozens of vehicles will be on display!

REGISTER HERE!

Event Sponsors:

Upcoming Events:

Natural Gas Vehicles - The Here and Now Technology, One-day Workshops:

- **October 2, 2014, Concord, NH** To register, click **here.**
- **November 20, 2014, Lincoln RI** To

register, click **here.**

Alt Energy Summit, September 13-14, 2014, Mt. Washington Auto Road, Gorham.
For more information and to register, click **here.**

Save the date! **NH Celebrates "National Drive Electric Week "(formerly National Plug-In Day). September 20, 2014, State House Plaza, Concord.** More information to follow.

News of Interest:

GSCCC welcomes its newest stakeholder! **Fuji Electric Corp. of America** has joined the Coalition. Visit their website at **www.americas.fujielectric.com**.

It's Official! NH fleets reduced a record amount of petroleum in 2013! The US Department of Energy has officially accepted our annual report, the results of your answers to our January survey. Collectively, GSCCC fleets reduced 1,669,794 gallons of petroleum in 2013! Based on your survey answers, greenhouse gas emissions savings last year was just under 15,000 tons. These numbers represent an increase of 16% over 2012. Keep up the good work!

Request for Proposals for the Operation and Maintenance of NH's State CNG Fueling Station.
The objective of this RFP is to ensure reliable access to CNG for State and Municipal fleets and to expand use of the fuel by making the Stickney Avenue station available to private fleets and the general public. Bid submission deadline is June 20th. **Click here for more information.**

Electric Vehicle Safety for Emergency Responders Online Course.
The National Alternative Fuels Training Consortium (NAFTC) is offering a limited number of firefighter scholarships to obtain

FREE online Electric Drive Vehicle First Responder Safety Training.
For more information **click here**.

FUNDING OPPORTUNITIES:

DES Diesel Emissions Reduction Rebate Program The NH Department of Environmental Services is taking applications on a first come first served basis for diesel vehicle and equipment upgrades, including the switch to alternative fuel systems and idle reduction technologies. **Click here** for more information and to apply.

Notice of Intent to Issue Funding Opportunity Announcement "Alternative Fuel Vehicle Deployment Initiatives" (DE-FOA-0000951)
The Office of Energy Efficiency and Renewable Energy's (EERE) Vehicle Technologies Office (VTO) intends to issue a Funding Opportunity Announcement (FOA) entitled "Alternative Fuel and Advanced Vehicle Deployment Initiatives." This FOA intends to select projects that will create and implement high impact and highly innovative approaches to increase the acceptance and deployment of alternative fuels, within the following areas of interests:

1) Alternative Fuel Vehicle Demonstration and Enhanced Driver Experience Project;
2) Alternative Fuel Training activities for first responders, public safety officials, and critical service providers;
3) Incorporating Alternative Fuels into Emergency Response and Preparedness Operations.

Stay tuned.

EPA announces a $9 million funding opportunity for the National Clean Diesel Funding Assistance Program Request for Proposals closes June 17, 2014. For details, visit: **www.epa.gov/diesel/prgnational.htm.**

QUESTION OF THE MONTH

Clean Cities Question of the Month: *What are the key terms to know when discussing hydrogen fuel, fuel cell vehicles, and hydrogen fueling infrastructure?*

Answer: It is important to know how to "talk the talk" when it comes to hydrogen and hydrogen-fueled vehicles. Becoming familiar with the terms below will help you better understand the fuel so you can ask the right questions and

make informed decisions.

Fuel

Considered an alternative fuel under the Energy Policy Act of 1992 (EPAct), **hydrogen (H2)** can dramatically reduce emissions and has the potential to significantly reduce our dependence on imported petroleum. While pure hydrogen is not abundant, it is present in water (H2O), hydrocarbons (e.g., methane, CH4), and other organic matter.

Although hydrogen is not currently widely used as a transportation fuel, government and industry are developing clean, economical, and safe hydrogen fuel and hydrogen-fueled vehicles. The first commercially available hydrogen vehicle is expected to be offered in select dealerships this year.

Vehicles

Fuel cell electric vehicles (FCEVs) are zero emission vehicles fueled by pure hydrogen gas stored directly in the vehicle. FCEVs are two to three times more efficient than a conventional vehicle powered by an internal combustion engine. FCEVs produce no harmful tailpipe emissions, have the ability to refuel in as little as three minutes, can achieve a range of more than 300 miles on a single fill-up, and may use other advanced efficiency technologies, such as regenerative braking systems.

Similar to battery electric vehicles, FCEVs use electricity to power a motor located near the vehicle's wheels. However, unlike other electric vehicles, FCEVs produce electricity from hydrogen using the **fuel cell,** leaving heat and water as byproducts. A fuel cell is a device that can convert the chemical energy of hydrogen into an electrical current through a chemical reaction with an oxidizing agent, such as oxygen. The most common type of fuel cell for vehicle applications is the **polymer electrolyte membrane (PEM)**. A PEM fuel cell is composed of an **electrolyte membrane** positioned between a **cathode** (positive electrode) and an **anode** (negative electrode). The hydrogen gas is introduced to the anode, while oxygen is introduced to the cathode. A **catalyst** (typically platinum) induces an electrochemical reaction that splits the hydrogen molecule into hydrogen ions. The protons are allowed to pass through the membrane while the electrons are forced to travel through an external circuit to produce electricity for the car. Then the electrons combine with the protons and oxygen at the cathode to form water, which is the fuel cell's exhaust.

The energy in 2.2 pounds (1 kilogram) of hydrogen gas provides about the same FCEV driving range as a conventional sedan propelled on 1 gallon on gasoline. Due to hydrogen's low energy content by volume, the fuel must be stored as a gas in the fuel tank at high pressures (10,000 pounds per square inch). Additional research is currently underway to optimize fuel storage.

At this time, FCEVs are more expensive than conventional vehicles, but are nearing commercial readiness. Many major original equipment manufacturers, including Honda, Hyundai, and Toyota, have announced plans to begin selling or leasing FCEVs to the public in 2014 and 2015 in certain markets.

Fuel Production

Hydrogen can be produced domestically from a variety of sources, such as natural gas, coal, and renewable resources (solar, wind, and biomass). The environmental impact and energy efficiency of hydrogen depends on how it is produced. A challenge of using hydrogen is efficiently and inexpensively producing hydrogen fuel.

Hydrogen for use in FCEVs is split from other molecules through either reforming (using steam) or electrolysis (using electricity and water). Currently, **natural gas reforming** is the cheapest and most efficient process to produce hydrogen in the United States.

If the hydrogen is produced through electrolysis from clean, renewable energy, FCEVs could produce zero lifecycle greenhouse gas emissions. There are projects underway to decrease the costs associated with these production methods.

Fueling Infrastructure

Hydrogen stations are typically located in areas of current or expected FCEV deployment, and can either be designed to store delivered hydrogen, or to produce hydrogen on-site (via electrolosys or reforming). Fueling sites include **storage tanks, compression, and fuel dispensing equipment**. Hydrogen fueling stations can be standalone operations or co-located with conventional fuel or natural gas dispensers. Applicable safety standards and codes specific to hydrogen fuel include the National Fire Protection Agency (NFPA)'s **NFPA 2: Hydrogen Technologies Code** (http://www.nfpa.org/catalog/product.asp?pid=211&cookie_test=1).

To date, most existing hydrogen fueling stations have been

constructed as part of demonstration projects. Earlier this month, the California Energy Commission (CEC) awarded nearly $47 million in grants for the development of a network of retail hydrogen fueling stations throughout the state. For additional information, please see the CEC's Notice of Proposed Awards (http://www.energy.ca.gov/contracts/PON-13-607_NOPA.pdf). As the FCEV market expands, fueling infrastructure is expected to continue to grow to meet the demand.

For more information on hydrogen fuel, vehicles, and infrastructure, you can visit the Alternative Fuels Data Center Hydrogen page (http://www.afdc.energy.gov/fuels/hydrogen.html) and the U.S. Department of Energy (DOE)'s Hydrogen and Fuel Cells Program page (http://www.hydrogen.energy.gov/).

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